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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TRAN, HIEN THI	
ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/916,287	Applicant(s) BENZ, UWE	
	Examiner Hien Tran	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/14/04 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: “50” (Fig. 4b). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

On page 7, line 16 apparently “hydrocarbon” should be changed to --methanol-- (note Fig. 1 and page 4, line 21).

On page 8, line 13 --or electrical heater-- should be inserted before “20” (note line 3); in line 16 “2” should be changed to --12-- (note line 12).

On page 10, line 16 --or main reaction stage-- should be inserted before “32” (note lines 6-7).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 26-45 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, the limitation of “so as not to be in thermal contact with the exhaust stream of the motor vehicle” (claims 26 and 45) is nowhere disclosed in the original specification.

This is a new matter rejection.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 33 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 33, lines 3-5 it is unclear as to how the heating means is related to the heating device set forth in claim 26.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

Art Unit: 1764

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 26-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 537,968 (Oshima et al) in view of Frazer (1,789,812).

As discussed in the above 112, 1st paragraph rejection, the limitation of “so as not to be in thermal contact with the exhaust stream of the motor vehicle” introduces new matter. Therefore the difference between the claimed device and that of the prior art cannot be identified by the specification of the instant application.

With respect to claims 26, 45, EP 537,968 discloses a nitrogen oxide reduction apparatus for an internal combustion engine comprising:

a reactor 2 containing a catalyst on which nitrogen oxide from exhaust of a motor vehicle is reduced via addition of hydrogen;

a device 102 arranged on-board of the motor vehicle for generating hydrogen; said generating device including at least one of a water vapor reformation reactor for water vapor reformation of HC on a catalyst and a partial oxidation reactor for partial oxidation of HC on a catalyst (col. 4, lines 41-58, col. 5, lines 1-14); and

Art Unit: 1764

an adjustable heating device (i.e. the bypass valve 110 and exhaust bypass conduit 111) coupled with at least one of the water vapor reformation reactor and the partial oxidation reactor.

The device 102 in EP 537,968 is a separate module arranged outside (i.e. surrounding) the exhaust pipe 101 of the motor vehicle (Fig. 1).

As best understood, the apparatus of EP 537,968 is substantially the same as that instantly claimed, but fails to disclose whether the heating device may be an electrical heater so as to heat the hydrogen generating device instead of using exhaust gas.

However, Frazer discloses the conventionality of heating the catalyst by heated gas or electrical heater or both (col. 2, lines 70-91, col. 3, lines 125-130, col. 4, lines 8-15).

It would have been obvious to one having ordinary skill in the art to substitute the electric heater of Frazer for the heated gas stream of EP 537,968 since the art recognized functional equivalency of electric heater and heated gas and since both are effective means for heating the catalyst to the operating temperature thereof. Since the hydrogen generating device of the EP 537,968 as modified by Frazer uses the electric heater instead of the exhaust gas, there is not need to locate the hydrogen generating device in thermal contact with the exhaust gas thereof.

With respect to claims 27-28, Frazer discloses the electrical resistance heater 42.

With respect to claim 29, EP 537,968 discloses that the catalyst comprises at least one of copper and zinc (col. 4, lines 41-58, col. 5, lines 1-14).

With respect to claims 30, 34, EP 537,968 discloses that the water vapor reformation reactor or the partial oxidation reactor further comprises an evaporator stage upstream of a main reaction stage in which the water vapor reformation on the catalyst occurs (col. 4, lines 41-58, col. 8, lines 15-22, Fig. 8).

Art Unit: 1764

With respect to claims 31, 38, 39, EP 537,968 discloses that the water vapor reformation reactor or the partial oxidation reactor further comprises an after treatment stage downstream of a main reaction stage in which the water vapor reformation on the catalyst occurs wherein in said after treatment stage, CO produced together with hydrogen is reduced by a shift reaction and a hydrogen yield is inherently increased (col. 8, lines 49-55).

With respect to claims 32, 40-41, EP 537,968 discloses the reactor for water vapor reformation or for partial oxidation is a tube, but is silent as to the specific diameter of the tube.

However, it would have been obvious to one having ordinary skill in the art to select an appropriate diameter for the reaction tube as to discover the optimum range within the prior art general conditions has been held to be obvious. In *re Aller et al* 105 USPQ 233.

With respect to claims 33, 35, providing a separate heating means for each stage of the reactor is within the purview of one having ordinary skill in the art during routine experimentation and optimization of the system, i.e. to facilitate the controlling of each stage.

With respect to claims 36, 37, EP 537,968 discloses that a feed device which product gas produced during said partial oxidation on the catalyst is guided against an outer wall of the partial oxidation reactor (note Fig. 6). It would have been obvious to one having ordinary skill in the art to alternately arrange the feed pipe so as to guide the product gas against the outer wall of the reactor as shown in Fig. 6 of EP 537,968, on the basis of its suitability for the intended use as a matter of obvious design choice.

With respect to claims 42-43, it would have been obvious to one having ordinary skill in the art to rearrange the stages within the reactor so as to better receive the heat from the central heating means during routine experimentation and optimization of the system.

With respect to claim 44, the device 102 in EP 537,968 is a separate module arranged outside (i.e. surrounding) the exhaust pipe 101 of the motor vehicle (Fig. 1).

Response to Arguments

10. Applicant's arguments filed 12/14/04 have been fully considered but they are not persuasive.

Applicant argues that on page 3, lines 19-22 of the instant specification, applicant explains that the device for generating hydrogen gas includes an adjustable heating device which can bring the catalyst to a predetermined temperature and therefore one having skill in the art would clearly understand that the catalyst is thermally independent of the exhaust stream of the motor vehicle. Such contention is not persuasive since the statement on page 3, lines 19-22 of the instant specification, applicant states that the heating device, independently of the hot exhaust gas, can brought the catalyst to a predetermine temperature. Such statement does not exclude the hot exhaust gas thereof. It just shows that both the hot exhaust and the heating device are both used to bring the catalyst to a predetermine temperature. The use of a separate heating device will be helpful during the time that the exhaust gas has not reached the operating temperature. Even applicant states that the hot exhaust gas is used to heat the reactor on page 8, lines 7-11. It should be noted that any negative limitation or exclusionary proviso must have basis in the original disclosure. The mere absence of a positive recitation is not a basis for an exclusion.

Applicant argues that the adjustable heating device in claim 26 does not become less clear or indefinite by the additional limitation provided in claim 33. Such contention is not persuasive as claim 33 recites a means for independently heating ... which is unclear as to whether such means is the same as to the adjustable heating device set forth in claim 26 or an

Art Unit: 1764

additional heating means and if it is an additional one, then how they are interrelated and where both are shown in the drawings.

Applicant argues that the office action indicates that the claims were not examined as they were presented to the PTO. Such contention is in error since all of the limitations in the instant claims, even though new matter, were addressed clearly in the previous office action and repeated in this office action (see the above rejections).

Applicant argues that in EP '948 provides no teaching that the hydrogen generating device is not in thermal contact with the exhaust stream. However, as discussed in the above 112, 1st paragraph rejection, the limitation of "so as not to be in thermal contact with the exhaust stream of the motor vehicle" in instant claims 26 and 45 introduces new matter, and the difference between the claimed device and that of the prior art, therefore, cannot be identified by the specification of the instant application.

As best understood, the apparatus of EP '948 is substantially the same as that of the instant claims, but fails to disclose whether the heating device may be an electrical heater so as to heat the hydrogen generating device instead of using exhaust gas. However, the secondary reference, Frazer, is relied upon for such teaching.

Applicant argues that the Frazer does not provide for a hydrogen generating device. Such contention is not persuasive as Frazer is relied upon for teaching the conventionality of heating the catalyst either by heated gas or electrical heater or both (col. 2, lines 70-91, col. 3, lines 125-130, col. 4, lines 8-15). It would have been obvious to one having ordinary skill in the art to substitute the electrical heater of Frazer for the heating means of EP 537,968 since the art recognized functional equivalency of electric heater and heated gas and since both are effective

Art Unit: 1764

means for heating the catalyst to the operating temperature thereof. Since the hydrogen generating device of the EP 537,968 as modified by Frazer uses the electric heater instead of the exhaust gas, therefore the hydrogen generating device is not in thermal contact with the exhaust gas thereof.

Applicant argues that the device of Frazer is in direct contact with exhaust gas and there is no disclosure in either Frazer or EP to provide any form of heating that is separate from the hot exhaust gas. Such contention is not persuasive as besides the hot exhaust gas, Frazer discloses other types of heating means, such as electrical heater, etc. (col. 2, lines 70-91, col. 3, lines 125-130, col. 4, lines 8-15).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 1764

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hien Tran whose telephone number is (571) 272-1454. The examiner can normally be reached on Tuesday-Friday from 7:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hien Tran

Hien Tran
Primary Examiner
Art Unit 1764

HT